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The Architectural Question of Vandhalla – to Compensate or to Stimulate?

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Abstract

In a Danish context, people with mobility impairments suffer from poor health compared with the rest of the population. They weigh more, exercise less and participate less in the cultural and social activities of everyday life. However, persons with disabilities, who are active in sports, are significantly more often employed, engaged in civic and voluntary activities and have a higher educational level compared with other persons with disabilities. In other words, participation in physical activities increases participation in other fields of society and functions as a lever for individual health and well-being.

Egmont, a Danish folk high school has already acknowledged the effect of sport in its work on rehabilitation, habilitation, health and well-being. Egmont is open to everyone but a majority of the students are persons with physical disabilities. In 2013 the new sport centre Vandhalla, which offers numerous new activities was opened. Using Vandhalla as a case, this article discusses how universal design in architecture can support the process of habilitation. Traditionally, accessible design intends to compensate for disabilities, but at Vandhalla the architecture stimulates rather than compensates. Hence the universal design of architecture inspires and supports activities as well as the student's abilities to be self-reliant. Furthermore it increases the sense of joy among the students which can be documented in ever-widening circles in their perceived quality of life.

Empirically, this paper is primarily based on a post-occupancy evaluation of Vandhalla. Interviews and walk-throughs were conducted with the winning team, the client, the teachers and the students. Data from other research projects conducted by the authors are included as examples.

The concept of 'A Challenging Space' is introduced and used as an analytical framework.

Keywords: universal design, rehabilitation, habilitation, health and well-being, participation

Background

With regard to disability and architecture, the emphasis has for many years been placed on *accessibility* as a means to compensate for lost ability, and often practiced as a special design solution specifically accommodating disabled users and hence enhancing stigma and focusing on what is missing rather than on what is present. With regard to disability and physical therapy and health, the focus has been on re-habilitation as opposed to habilitation, resulting to some degree in the same sort of stigma, and enhancing a physical ideal which might be irrelevant to many users.

The project, Vandhalla sports and swimming facility, presented in this article had a basis background in several different aspects of the interaction between architecture, universal design, habilitation and disability, all brought together in synergy in a stimulating architectural space which may enhance self-reliant abilities for the users of the space. The article questions the rehabilitation/accessibility approach as a means to enhance architectural quality or stimulating experiences of space for persons living with a disability. Instead we point to the potential of architecture and universal design to stimulate and challenge the disabled users to expand their individual and personal abilities and hence define new ways of designing and defining how to accommodate disabled users in architecture.

Sport activities and quality of life

Physical activities play an important role for the health and well-being of all people, including people with disabilities. Nevertheless, research shows that people with disabilities less often practice organised sport than able-bodied people. Having a disability, thus negatively affects the likelihood of practising sport (Damgaard et al. 2013). Several studies have shown the effect of physical activity amongst people with a disability. The general health condition of people with disabilities is poorer compared with the rest of the population concerning smoking, eating habits and sedentary physical activity and excess weight as well as alcohol use (Johnsen et al. 2014).

A Swedish study points out that the well-being of people with disabilities, who are active in sport or exercise regularly, is higher than that of those who do not exercise. Furthermore, a higher percentage of people with disabilities who are physically active in sport are also working or studying compared with physically inactive people with disabilities. Similarly the perceived quality of life is higher among people with disabilities who are active in sport (Norlin, 2008).

Another aspect of life, health and well-being is the social aspect. In the case of institutionalised participation or activities like being together with family, club activities and voluntary work, a disability is not regarded as a barrier by the respondents with disabilities. But the disability is rather a barrier in connection with everyday activities anchored in social activities like drinking coffee at a café, watching a movie in the cinema or other ways of spending time with friends. Because these activities depends on having a sense of belonging to a group of friends and knowing how to cope with the social strategies that these social activities requires (Damgaard et al., 2013)

A Danish quantitative study showed a significant correlation between being physically active in sport on a regular basis and being active in other areas of the society; the civic activities of employment, educational status, leisure time schooling, voluntary work and a participation in disability organisations (Kissow et al., 2012). Kissow conducted a qualitative study in order to study how people with disabilities being active in sport participate across a variety of contexts. Her study shows that experience from one context is carried into other contexts. Hence, participation in one setting promotes participation in another context. In addition, persons with disabilities experience that they develop abilities that they can use in other contexts. Moreover, it is their impression that their participation and their active part in sport open doors for participation in other situations because other people show interest in them, become less uneasy about their presence and instead consider them as a resource. In comparison with other social communities in society, sport activities in the Danish context are relatively easy to participate in due to the organisation and institutionalisation of sport. Therefore physical activities function as a driver for social participation in other settings because of its role as a 'positive spiral of participation' (Kissow, 2013).

Accessibility

In general, the concept of accessibility in the built environment is regarded as a means to accommodate for people with disabilities, in particular wheelchair users and to some degree visually impaired users. Most practitioners interpret accessibility as being equivalent to the minimum requirements in building regulations and as such the concept of accessibility appears to be a fairly effective legislative tool to ensure physical access to the built environment. However, it is also acknowledged that building requirements focus only on some user needs; hence many user needs and their complex interactions are not included in many building projects as they are not included in the legislative framework (Ryhl, 2009). Furthermore this narrow, legislative and primarily wheelchair-focused approach to accessibility reflects an understanding of accessible designs being special design solutions for disabled user, which appears only to further stigmatise people with disabilities (Frandsen et al, 2012). The design concept of universal design offers a new approach to understanding the users, their diversity and the complexity of users' needs by regarding all users as potential users of universal design throughout their lifetime. Furthermore, as the concept is not interpreted as specific pre-defined design solutions, it holds the potential of being regarded as a more dynamic approach as well as solution. In this line of understanding it is also relevant to talk about the current interpretation of universal design in the Danish context as 1st generation (Grangaard and Ryhl, 2016a). Accessibility in the Danish context is most often regarded as a specific, non-dynamic and very functional approach to ensure that the design compensates for the lack of ability and hence compensates for the disability (Ryhl, 2009, 2016). Yet it seems there is a need for a different approach which through design might open up for new and innovative solutions, more dynamic and reciprocating design that offers more than just practical and compensating solutions, but also stimulation, experiences and the possibility to develop individual abilities of the users through challenge. Universal design might hold the potential to be this tool.

Egmont and Vandhalla

Egmont is a historical institution in the Danish folk high school¹ tradition and system. It was established in 1956 by Olaf Lauth and is the first of its kind in Denmark as it was targeted specifically at disabled students. And in particular students with mobility impairment and wheelchair users. Besides defining disabled users and their personal assistants as the target group, Egmont is also characterised by its vision of empowering students to achieve personal growth and development. It is not only the intention to offer a boarding school experience among peers, but even more so to support all students in their individual growth and development, so that they discover new and strengthened abilities. Through their own empowerment they leave the school with a stronger sense of being part of society, being able to navigate in public spaces. Hence, Egmont aims at more than compensation and functionality and strives to define undiscovered territories, preferably through stimulation, collaboration with their personal assistant and by challenging the individual student all the way². It is the impression of the head of school Ole Lauth that the general institutionalised system focuses more on rehabilitation than habilitation, although the UN Convention on the Rights of Persons with Disabilities embraces both. At Egmont, their vision emphasises the relevance of focusing on habilitation, because more than half of the students have had their disability all their life (Grangaard and Ryhl, 2016b).

The initial buildings at Egmont were not accessible to wheelchairs, but accommodations were made along the way. In 1961, the original buildings were replaced with new construction. Since then, Egmont has been accessible. Today 180 students are accepted every year. Numerous expansion projects have been realised and in 2013 the 50-year-old dream of building a sports and swimming facility for the students was fulfilled³.

Vandhalla sports and swimming facility was designed by a team consisting of the two architect firms Cubo and Force4, which won the design competition. Both firms had very little experience and knowledge of accessibility and universal design as they entered the design competition. During the design process of Vandhalla, they also won the design competition for a new headquarters for the Danish Disability Organization, which meant that knowledge and references were to a certain extent mutually exchanged between the two projects.

Vandhalla is the name of the sports and swimming facility inaugurated in 2013 and since then used every day by the students and employees at Egmont, as well as by the local villagers. One of the specific mile stones of Vandhalla is the construction of a fully accessible water slide, to be used by all students, regardless of abilities. It is the first of its kind in Denmark (Grangaard and Ryhl, 2016b). But Vandhalla also presents an ambition of architectural design to match the vision of Egmont; a building design which stimulates and challenges and in the process supports students in their personal development and growth. In this paper, we present the result of our evaluation of the project and our analysis of Vandhalla's design potential as best practice of universal design interpreted as a means to stimulate and empower as opposed to compensate and secure.

¹ The Danish Folk high school system was founded in 1844 and today there are about 70 such schools in Denmark. The school is a boarding school for students 18+, offering non-formal adult education, based on the idea of offering a new kind of education to those who did not attend schools for social or economic reasons, and hence strengthen the democratic development of the country (www.vallekilde.dk [accessed 20 November 2016].)

² Egmont-hs.dk [accessed 20 November 2016].

³ Egmont-hs.dk [accessed 20 November 2016].

Method and research design

The post-occupancy evaluation, POE (Preiser et al, 1988) of Vandhalla was based on fieldwork and the access to written material; the competition brief, the winning design proposal from phase one and two, as-built material and the evaluation report from the members of the competition panel. The approach to the POE and the fieldwork was qualitative. The fieldwork consisted of interviews and walk-throughs. The research interview can be characterised as a professional conversation. Emphasising *inter* and *view*, the result is the construction of knowledge which develops in the interaction between the interviewer and the interviewee. Not to mention the exchange of viewpoints during the conversation (Brinkmann and Kvale, 2015).

Within the process architecture approach, strategies and tools has been developed to involve the users in an iterative workplace design process. One significant tool is 'structured events' characterising activities that create a common understanding and language during a process of user-involvement or an evaluation. *Walk-through* is such a *structured event* (Horgen et al, 1999). Walk-through as a method was chosen in this project in order to create an opportunity to talk about everything we observed during the walk as well as with people we met in the building as we walked through it. Especially in relation to the architect, it was the intention not merely to hear a 'sales pitch' about the architectural design, but also to gain insight into the design process, the competition and the realisation/construction of the building. Regarding the head of school, it was the intention to talk about the use of the actual space instead of the memory of the space, as it is used and experienced in the occupancy phase. Furthermore we interviewed several users whom we met as we walked through the building. The experiences and the stories of the users play a significant role in the evaluation together with photos from the walk-throughs.

A walk-through with the architect from Cubo and a walk-through with the principal were conducted on-site at Egmont. Interviews were also held with three sport instructors, the facility manager, a personal assistant and two students. One of the students had suffered brain-damage; hence the interview was conducted as a conversation between him, his personal assistant and his physiotherapist after a session of fitness training, which we had observed. We furthermore observed students in the swimming pool and talked with them there as well as in the dining hall. The walk-through interviews were later supplemented with an interview with the architect from Force4. The focus was on questions derived from the fieldwork at the Egmont.

Both walk-throughs and interviews were recorded on video and transcribed. The authors have translated the quotes from Danish into English in this article.

Universal design

Historically, the issue of ensuring accessibility to the built environment has been considered a matter of compensating for lost abilities through design, and in particular with a focus on physical accessibility, which has been described by a number of people. This focus may in part be explained by the historical significant absence of accessibility, hence the priority has been to ensure access rather than demand stimulation and experiences in the process. Salmen showed how accessibility is generally used to describe minimum requirements in building regulations to ensure physical accessibility for people with disability (Salmen, 2001). This understanding of the concepts is confirmed by Ryhl in her analysis of the differences between accessibility and universal design. She furthermore emphasises universal design's potential for including sensory aspects of both functionality and stimulating experiences of architectural space (Ryhl, 2003, 2009). Steinfeld and Danford also describes the mono-focus on accessibility as related to physical aspects of movement (Danford and Steinfeld, 1999) and Iwarsson and Ståhl in their seminal analysis of the concepts in question further underlines how accessibility in general is perceived as descriptive of functioning, functionality and physical access to the built environment for disabled users (Iwarsson and Ståhl, 2003, Ryhl, 2009)

The crucial architectural quality of stimulating the abilities that are functioning, points to the potential of securing sensory experiences or accommodating for sensory functionality as an, to some decisive, alternative to physical functionality. Ryhl in her work (2003, 2009, 2010, 2016) explored and discussed the sensory aspects of universal design as key to the large number of users living with a sensory disability. She introduced the concept of sensory accessibility as a supplement to physical accessibility and a tool to nuance both user needs and architectural design solutions. In her work, she draws on Pallasmaa's seminal work on understanding and acknowledging the role of sensory experiences and stimulation in our general perception of architecture as well as our existential understanding of our being in the world. Pallasmaa underlines the importance of architectural stimulation to human well-being, identity and development and in the process explores the understanding of architectural design, not as a passive frame for our lives but as a dynamic physical and sensory frame with which we are in constant interplay and dialogue (Pallasmaa, 1996)

A Challenging Space

The concept of a *challenging space* was defined as an analytical tool in the process of evaluating Vandhalla. A concept was needed to describe the characteristics of the space and the interplay between the activity, the architectural design and the pedagogical approach to rehabilitation and habilitation at Egmont. At the same time, the concept was developed on the basis of the empirical material as a reciprocal process. It is described and furthermore used in the analysis of three examples of Vandhalla.

The concept of a challenging space

Solidarity among the students is a core aspect of the vision of Egmont. It is the aim to challenge the student, assure experience and provide important personal nudges. Because a stay at Egmont concentrates around aspects of development, learning, overcoming and maybe more importantly, being a part of a community – all these elements contribute to making a stay at Egmont exceptional.

When the sport instructors talked about the pedagogical effort, he mentioned Egmont's focus on 'scaffolding' as a teaching approach which at Egmont is related to 'developing through challenging' by finding and upgrading the student's zone of proximal development.

....the key is always to identify the zone of proximal development and then upgrade it. [teacher and physiotherapist]

The concept of zone of proximal development (ZPD) was developed by Vygotsky (Vygotsky, 1978). The ZPD characterises the gap between the actual developmental level where the child can perform without guidance and the level of potential development where the child can perform under guidance. Within that span, a certain activity, which would normally be too difficult for a child to perform, can become attainable due to guidance or collaboration with more trained or skilled peers (ibid). Such guidance acts as a kind of support to reach the potential development. It is emphasised that all children have a ZPD that can be evoked. But because the children have different potential for development, there will be differences in their performance (Hasse, 2013).

In addition to guidance from an instructor or peers, the activity was situated and therefore dependent on the qualities of the space. Vygotsky saw the environment as a resource rather than merely as a context (Vygotsky, 1994). The architectural space is a pivotal part of the environment together with the pedagogical practice, and at Egmont it appears that the architectural space in its design as 'a challenging space' is core in the result of Egmont offering the students the possibility to not only be active, but also to challenge their abilities and develop them to reach a higher ZPD.

Three examples of a challenging space

The first example is the changing area, which included several different spaces and changing facilities. While structuring and designing the changing area, the architects focused on *flow* as the defining design parameter. Due

to the winning teams' focus on equality, they wanted everybody to arrive at the indoor swimming pool through the same door or, as a minimum, same type of door, in order to avoid that people with a disability were referred to a secondary entrance. The client insisted on the need for individual changing 'cubicles' with both toilet and shower described in the competition brief, even though the engineer specialising in swimming pools did not find it necessary to operate with different types of spaces for changing. However, it was important for the client to create the option of a safe and private space.

The design consisted of three traditional changing rooms where everybody changed together. It was possible to open up between the two of them in order to combine them into one for greater flexibility. Six individual cubicles were placed in the transition between the changing area and the main passage leading to the gym and the workout room. From five cubicles, the entrance to the pool area passed through the changing room as a response to the idea about flow and equality. Then everybody enters the swimming pool area from the same doors – the doors to the changing rooms.



Figure 1. A cubicle

The personnel and the students were enthusiastic about the design of the changing zone because they literally saw the flexibility and the possibilities for privacy and security that these cubicles created.

... and then you can use a cubicle or the big changing room. It depends on how much help you need, or if for example you do not want to show all. (...) it does not exist other places. It is exceptional. [student]

The cubicles and the traditional changing rooms supplemented each other. For some students it would be overwhelming to change into a bathing suit in a changing room together with other students. But after a while, when the students had changed alone in a cubicle, they would perhaps be ready to use the changing room. This combination of changing facilities was important to the overall vision of offering dignified and respectful situations around the activities of everyday life at Egmont. The changing area offered a space that attempts to accommodate the vision and as such be used to enhance the individual ZPD of every student.

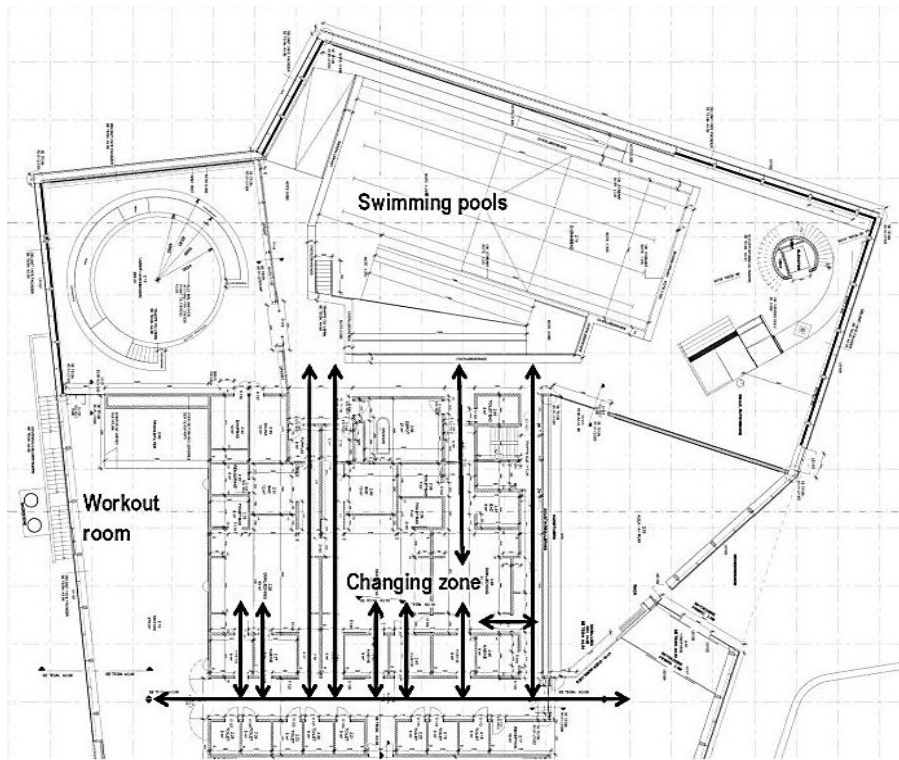


Figure 2. A plan of the changing zone and the swimming pool. The arrows show the flow.

The second example shows the design of the swimming pool and in particular the choice of several different ways of entering the pool. The winning team initially designed one specific solution that should be used by all; a ramp into the pool. This was with the clear intention of creating equality, as their interpretation of equality in design was to design one solution that would work for all. In addition, the team had designed a traditional ladder to access the pool for those who wanted a shortcut and a raised edge that could be used as a transfer seat as well as to sit on when jumping to the water.

However, the competition panel criticised the design proposal with the ramp, as they argued that the ramp's length would be a barrier to using it for some people. Thus their understanding of equality changed and their design proposal changed from one specific solution to a combination of various design elements addressing of the diversity of user needs.



Figure 3. The ramp to the pool.

The different ways of entering the pool was used by the different kinds of users, but also as a tool for individual progression by giving the students a motivational push towards activating their individual ZPD.

... I have mixed classes where some of the students walk and jumps into the water in the deepest part of the pool. Some of the students lie on a stretcher being driven down the ramp. And others who have difficulty in walking, we encourage to use the stairs. I also have the possibility of initiating a progression about the way they enter the pool.
[teacher and physiotherapist]

The third example is the design of the fitness centre/workout room. The winning team designed a workout room that could contain different kinds of equipment. They focused on creating a connection to the rest of the school by establishing a mutual visual connection between the workout room and the swimming pool area and between the workout room and the gym. A lot of natural daylight was prioritised as part of the design too. The client decided to buy equipment that could be used by everyone regardless of their physical condition.



Figure 4. The workout room.

The student Aleks emphasised the benefits of the equipment being similar to the equipment that you would find in a commercial fitness centre – it appeared as a ‘normal fitness centre’. It was the goal that if a student could exercise at Egmont, it would be possible to exercise in a fitness centre anywhere else as well. Furthermore the Egmont participated in the research project ‘Movement lab’ which focuses on creating meaningful activity between people with disabilities and their personal assistant in order to create common experiences and increase the motivation for physical activity by also using new technology for charting the development of the users.

Clearly, the workout room was a success.

There is much more room for equipment and the so-called ‘torture chamber’ is really something that the students use. Some of them can stay there for hours. [teacher]

The final design of the workout room appears to ensure different possibilities for exercising which supported the different kinds of users and their individual ZPD.

Discussion

While Egmont both as a school and as builders set the bar high for universal design and functionality for all, regardless of abilities, the case of Vandhalla documents the possibilities of architectural and universal design as supporting individual growth and empowerment.

If both Egmont and the architects had settled for the traditional understanding of accessibility as a means of accommodating for disability with a strong emphasis on functionality in the narrow way that Salmen, Danford and Steinfeld and even Iwarsson and Ståhl describes the concept, Vandhalla would not have defined the accessible solutions as the rich and varied combination of diverse solutions, as turned out to be the case. Through testing and questioning as well as understanding the high level of diversity amongst users, not only with regard to functionality, but just as much with regard to emotions, safety, security, familiarity and comfort zones, the architects managed to develop new and more complex design solutions specific to both the building and the use/users, resulting in a high level of perceived quality by the daily users of Vandhalla. Furthermore their emphasis on design as sensory stimulation and architectural experiences, they have also shown how universal design may be a decisive component in creating synergy between disability, universal design and architecture.

This understanding of the aspects of architecture which lies beyond functionality, without disregarding functionality, but only supplementing it with more aspects and requirements, is not often seen in relation to accessibility. But through inclusion of emotional, cognitive, sensory and social aspects of architecture, the architects make the leap from accessibility to universal design and even interprets the concept of universal design as a dynamic factor which in Vandhalla is enhanced in quality through stimulating interaction between body, space and pedagogy. Hence universal design is not a passive and pre-fixed design solution, but it is somehow strengthened through use and synergy.

In this article we have introduced the analytical concept *a challenging space* in order to identify how universal design of a space in Vandhalla supported the process of rehabilitation and habilitation at Egmont. It became clear for us that the quality of the space was not only the ability to accommodate for different kinds of disabilities by providing a combination of different designs and possibilities for fundamental activities; to change clothes, to enter the pool, to exercise etc. The quality of the space was just as much its ability to support individual progression in abilities and personal empowerment as it offered different kinds of activities or situations to accommodate an individual ZPD. *A challenging space* as a concept could answer our request for a design concept that would correspond to the ZPD. Because universal design offers not one design solution for all to use, but a combination of solutions, hence accommodating for differences in individual needs and user diversity. It was important to acknowledge that the elements of invitation and security were core qualities of the challenging space at Vandhalla. Our findings point to both elements being decisive to the success of the design.

The spatial encouragement managed to challenge the students along with the factor that the students were able to see what was going on within the space and hence experiencing a tacit invitation to explore the space themselves. Without these qualities, it would have been much more difficult to ac-

compish the positive results in personal development for so many of the students as it appears to be the case after the Vandhalla was inaugurated.

Another aspect of the invitation was the possibility to watch from the outside how other students performed various activities which served as an inspiration for the students choosing first to be passive observers – and as such the design of the space invited to activity – and often an activity that the students had not tried before or was not familiar with. The water slide was an exceptional example of this.

... as for the water slide, the students are nervous wrecks just thinking about trying it. Then they see someone else coming down it and then they try it themselves. And it is SO amazing to witness. [teacher]

Another quality was the sense of familiarity – by getting used to the pool it became possible for the students to visit other swimming pools for example when they would return to their hometown or move to live in another place. Furthermore it was the ambition at Egmont that an experience that surmounts apprehension could lead to more physical activity among the students at Egmont because they achieved something that they thought they would never dare to do.

The stimulation of the ZPD was characteristic of the challenging space. Contrary to accessibility which traditionally has been interpreted as a design concept as a means to compensate for the disability – the lack of ability, the idea of a *challenging space* was intended to develop, or even more to strengthen, the existing abilities or using them in the process of assisting the student in becoming more fit or self-reliant. This quality makes it an example of universal design and makes it suitable for all kinds of users.

There can be very individual reasons for being physically active, but for one of the instructors it was fundamentally about enjoyment because the students themselves discovered the real joy of sport. The hope is that this joy will become a driver and that the students also after having left Egmont will be active in sports, not purely because they should, but because they like it. And hence also benefit from the many positive effects of an active sports life documented by eg. Kissow and Johnsen et al.

So while Egmont in Vandhalla in many ways accommodates for accessibility needs as understood in a prescriptive and functionality focused way, documented by several researchers, Egmont furthermore shows how universal design can be interpreted as a dynamic, spatial challenging and sensory stimulating factor enhancing individual development and empowerment. In this understanding of Universal design as a stimulating factor as opposed to compensating, Vandhalla furthermore stands as an example in practice of Pallasmaa's theories of architecture's role of creating human well-being, sensory stimulation, identity, personal development and a sense of belonging in the world – as well as being part of a greater social context.

We believe that Vandhalla through its focus on stimulation as opposed to compensation stands as an important example of the potentials of universal design interpretation as well as an architectural reflection of Egmont's value based vision of individual development and empowerment of their students through challenges.

Conclusion

Based on an evaluation of Vandhalla, a sport centre, we have proposed the concept of a *challenging space* in order to analyse and describe how the space stimulate and support the student in their process of development and empowerment. Based on three examples of spaces; the changing zone, the pool and the workout room the analysis point at a quality of the space where the space offers different a combination of design solutions that can support individual needs and user diversity and the students individual progression and empowerment. Thus the space as a challenging space stimulates the individual zone of development of each student. Furthermore, it would be relevant to operate with space as a challenging space in healthcare and public health in order to create health and joy of life. We find that this quality of the space is characteristic of universal design as opposed to accessibility where the focus is to compensate for the disability.

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